

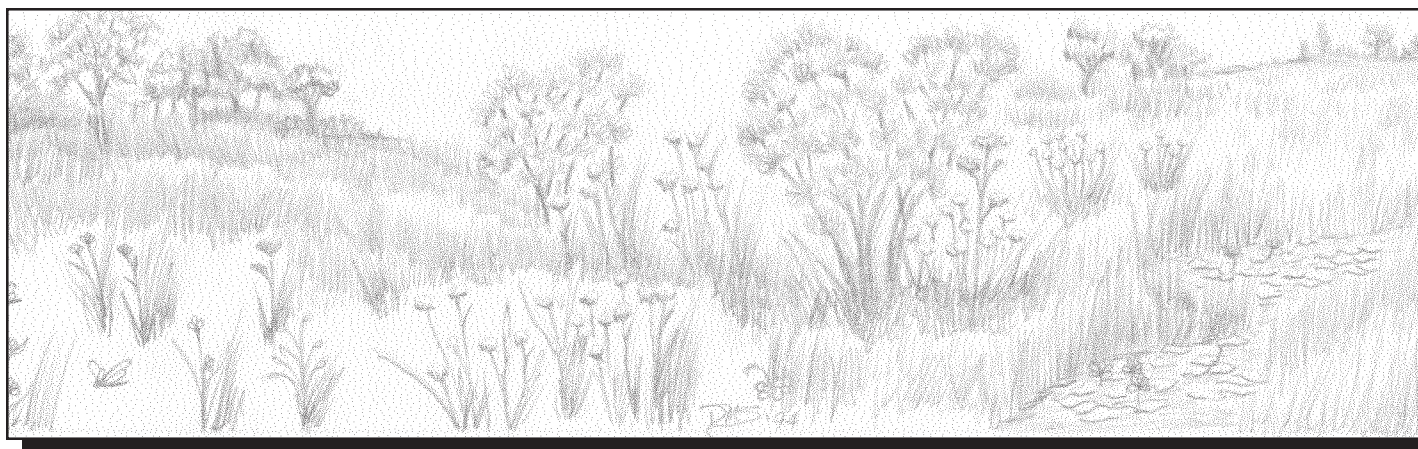
Natural Heritage Resources Fact Sheet

Virginia's Rare Natural Environments

Sea-level Fens

Description

Virginia's sea-level fens are an extremely rare type of coastal wetland distinguished from a marsh and a bog by a distinct hydrologic regime and unique vegetation associations. In general, sea-level fens are open, freshwater wetlands located at the upland edges of wide, oceanside tidal marshes. Unlike bogs, whose primary water source is rainwater, a sea-level fen's primary water source is an underground spring that supplies nutrient-poor groundwater to the system. For a sea-level fen to form, a combination of environmental factors must occur. First, a natural spring, usually seeping from a nearby slope, must be present to allow the movement of groundwater into the area. Second, the fen must be sufficiently protected from flooding, such as by a wide, fronting tidal marsh, to prevent the influx of nutrient-rich tidal flow. If these two conditions are met, unique plant associations that include both northern bog species and southern freshwater tidal species can form, and diagnostic plant species such as ten-angled pipewort and beaked spike-rush can thrive. It is uncommon to find this combination of environmental factors, which accounts for the rarity of this community type.



Sea-level Fen Community

Distribution

Sea-level fens were first discovered in 1991. Superior examples of this community type have been found in only five locations on the East Coast, and cover a total of no more than 10 acres. Although there are likely many more examples of this community type, thus far they have only been documented in Sussex County, Del., and in Accomack County on Virginia's Eastern Shore.

Flora and Fauna

The low nutrient content of the water and the acidic conditions of

the soil strongly affect the plants and animals that exist in sea-level fens. Vegetation consists of an interesting combination of acid-tolerant bog plants and tidal freshwater wetland plants capable of surviving in low-nutrient areas. For some of these species, the Virginia sea-level fens represent the southernmost extent of their range, and the only habitat that supports these species in the state. Most interesting among the vegetation are the many carnivorous plants such as sundew and bladderwort which capture and digest small insects and invertebrates.

Since their discovery in 1991, few investigations into the resident animal populations of sea-level fens have been conducted. However, one species of interest found in these areas is a dragonfly, *Nanothemis bella*, which, at 3/4 inch long, is the smallest northeastern dragonfly. Also characteristic of these environments is the eastern mud turtle which, not surprisingly, thrives in the mucky, springy habitat.

Values

The natural heritage values associated with these small wetlands are focused primarily on the plant and

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animal species that they harbor; often these communities are the only location for a species in the state. The number of rare species documented in fens is significant. These areas are also ecologically interesting in that they incorporate both freshwater marsh plants and acid-tolerant bog plants which are more common in northern bogs.

Threats

By far the biggest threat to this rare community type is groundwater pollution. The possible movement of fertilizers and wastes into the groundwater from nearby develop-

ments or agricultural fields can cause an influx of nutrients into the fen. This upsets the balance of water and nutrients in the area and leads to the disruption of soil characteristics and plant species that exist in fen conditions. Increased nutrient and sediment flow could result in suitable environmental conditions for the growth of invasive species such as common reed.

Protection:

Protection of these rare wetland communities will take a concentrated effort on the part of landowners and environmental agencies to

prevent the flow of high nutrient water and sediments into these areas. Although fens may be protected to some extent by wetland regulations of the Federal Clean Water Act, negative influences from surrounding environments can be devastating to these areas and protection is essential to ensure their continued existence.

References

Ludwig, J. C. and T. J. Rawinski. 1993. The vegetation and flora of the "sea-level fens" of the Delmarva peninsula. *Virginia Journal of Science* **44**:120.

For more information, contact the Department of Conservation and Recreation.

